

gradually widened, and finally the entire sliding surfaces of the brushes rub against the commutator. The brushes 11 are shaped so that the both ends rub against the commutator 5 in order to progress aging between the brushes and the commutator 5 as early as possible in a primary stage after completing the assembly of the rotary electric machine, whereby noise is early reduced. This shape of the brushes 11 is adopted in conventional techniques.

Page 3, paragraph 1:

In the rotary electric machine constructed as described above, when the armature 3 rotates, the commutator 5, fixed by pressing into the shaft 4, rotates in the same direction at the same rotational speed as that of the armature 3. When the commutator 5 rotates, the brushes 11 slide on the surface of the commutator 5 and are pressed and in contact with the commutator 5 by the springs 12. In particular, immediately after completing the assembly of the rotary electric machine, a sliding condition between the surface of the commutator 5 and the brushes 11 is not stabilized. Therefore, in order to reduce noise caused along with the sliding motion by the brushes 11 and stabilize the performance of the rotary electric machine, a relatively small current is applied to the rotary electric machine after completing the assembly of the rotary electric machine, and the armature 3 is rotated to stabilize the sliding motion between the brushes 11 and the surface of the commutator 5. This is generally called “shakedown”, wherein because the shakedown process requires a substantial time, a drop of productivity and a cost increment are caused.

Page 3 paragraph 2, which bridges over to page 4:

Further, because a carbon coat is not produced on the surface of the commutator 5 immediately after completing the assembly of the rotational electric machine, a relatively large current applied to the rotary electric machine for measuring the performance is apt to generate spark. Therefore, the spark roughens the surface of the commutator 5, whereby noise is caused and lifetimes of the commutator and the brushes are shortened. To deal therewith, it is necessary to measure the performance after the shakedown process, whereby the drop of productivity and the cost increment are caused.

Page 9, paragraph 1, which bridges over to page 10:

As described, according to Embodiment 1, the shakedown brush 21 other than the brushes 11 is used to rub the surface of the commutator 5 in advance. Therefore, it is possible to shakedown the surface of the commutator 5 in advance, a burr on the surface of the commutator 5 or the like can be removed, a sliding motion of the brushes 11 can be stabilized, noise of the rotary electric machine can be reduced in early stages, and the performance can be stabilized, whereby it becomes possible to reduce or eliminate the aging process, productivity can be improved, and the cost of the rotary electric machine can be lowered.

Page 10, paragraph 1:

Further, since the surface of the commutator 5 is rubbed by the shakedown brush 21 other than the brushes 11, the carbon coat is produced on the surface of the commutator 5 in advance, and generation of spark is restricted to prevent the surface of the commutator 5 from roughening, whereby noise of the rotary electric machine can be reduced in early stages, and the performance

can be stabilized, whereby it is possible to reduce or eliminate the aging process, the productivity can be improved, and the cost of the rotary electric machine can be lowered.

Page 10, paragraph 2:

Further, since the width W3 of the sliding trace 22 of the shakedown brush 21 is larger than the sliding widths W1 and W2 of the sliding traces 13 of the brushes 11, even though positions of the shakedown brush 21 and the brushes 11 are misaligned in some degree, the carbon coat is produced on the surface of the commutator 5 in advance, whereby it is possible to reduce or eliminate the aging process, the productivity can be improved, and the cost of the rotary electric machine can be lowered.

Page 11, paragraph 3:

Further, since the present invention is applied to motors for electromotive power steering device, particularly requiring low noise, the carbon coat is produced in advance, and a burr or the like is removed, it is possible to reduce or eliminate the long aging process, required in the conventional technique, and a mass production of rotary electric machines at a low cost becomes possible.

Page 12, paragraph 1:

Further, since the step of rubbing the surface of the commutator 5 by the shakedown brush 21 other than the brushes 11 in advance is provided, the carbon coat is produced by the shakedown brush 21 in advance, and a burr or the like on the surface of the commutator 5 is removed in advance, noise of the rotary electric machine is reduced in early stages, and the

performance is stabilized, whereby the aging process can be reduced or eliminated, the productivity can be improved, and the cost of the rotary electric machine can be lowered.

Page 12, paragraph 3 , which bridges over to page 13:

Further, since the step of rubbing the surface of the commutator 5 by the shakedown brush 21 other than the brushes 11 in advance is provided while the armature 3 stands as a single unit, the carbon coat is produced on the surface of the commutator 5, whereby burrs and scars on the surface of the commutator 5 are removed by the shakedown brush 21, noise of the rotary electric machine can be reduced in early stages, and the performance can be stabilized, whereby it is possible to reduce or eliminate the aging process, the productivity can be improved, and the cost of the rotary electric machine can be lowered.

Page 13, paragraph 2, which bridges over to page 14:

Further, since the step of rubbing the surface of commutator 5 in advance without applying electricity to the shakedown brush 21, the surface of the commutator 5 is not made rough by spark, noise of the rotary electric machine is reduced in early stages, and the aging process is reduced or eliminated, whereby the productivity can be improved and the cost of the rotary electric machine can be lowered. Further, the number of the shakedown brushes 21 and the positions of the shakedown brushes 21 are freely set.

Page 14, paragraph 1:

Although, in FIG. 1, the example that the armature stands as the single unit has been described. However, the surface of the commutator 5 may be rubbed with the shakedown brush